step (1), all oligonucleotide probes on the chip synchronously in a template-dependent manner so that the information under investigation is transferred from the target sequences of the templates to the probes,
(4) cleaving and mass spectrometrically measuring the spatially separated probes, and
(5) extracting the detailed sequence information from the mass measurements of the probes.

13. The method according to claim 12, wherein insertion and deletion mutations are analyzed by the additional template specificity of the reporter oligonucleotides.

20. The method according to claim 16, wherein single strand mismatches of hybridizations between probes and target sequences are identifiable by template-dependent nuclease digests of the photocleavable probes.

24. The method according to claim 21, wherein the ribonucleotides of the photocleavable probes are template-dependently digested when there is perfect base pairing, leading to detection of the mismatch in the photocleavable probes.

25. The method according to claim 9, wherein the hybridization of the target sequences to the photocleavable oligonucleotide probes and their template-dependent modification are performed cyclicly a number of times.

26. The method according to claim 25, wherein the enzymes utilized are heat stable and the reaction mixture is repeatedly warmed directly on the chip.